Sustainable Conservation

theEARTH GENOME
REVEALING THE POSSIBLE

A Groundwater Recharge Assessment Tool (GRAT) to support planning for cost-effective aquifer recharge

Snapshot

- End-Users. Groundwater Sustainability Agencies (GSAs)
- Decision. Assess service area for optimized locations and methods to capture available flows for groundwater replenishment
- Desired Outcome. Cost effective aquifer recharge that helps move basins toward balance
- Status. GRAT version 1 of tool released in Summer 2017
- Project participants. Currently, Madera and Tulare Irrigation Districts with plans to extend to other GSAs in second half of 2017

Opportunity

Long-term groundwater overdraft and five years of drought in the San Joaquin Valley (SJV) are threatening the reliability of drinking water for local communities and irrigation water for crop production. Additionally, the California Sustainable Groundwater Management Act requires newly formed GSAs to develop groundwater sustainability plans (GSPs) by 2020 to manage groundwater supplies to ensure long-term sustainable yields and avoid undesirable results.

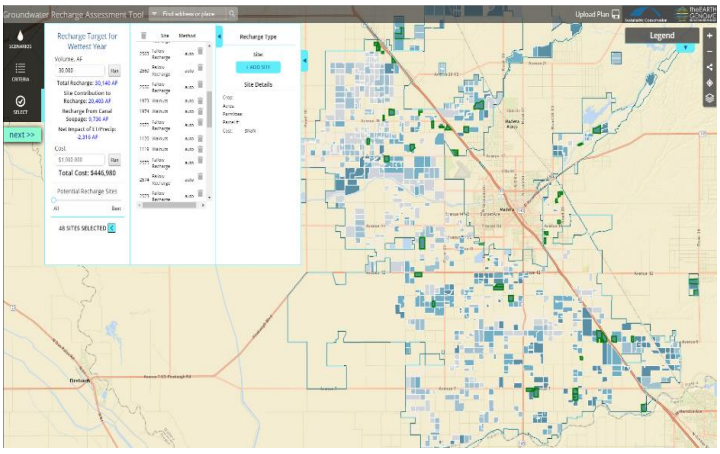
What is needed

There is a lack of easily accessible information about the optimal locations and methods to capture available flows for groundwater replenishment. GSAs want to know where and how to cost-effectively recharge groundwater sources when excess surface waters are available. The project team is working hand-in-hand with irrigation districts/GSAs to define their exact user and tool requirements, with the explicit goal to improve operational decisions and inform GSPs.

Why the tool is valuable

GRAT provides irrigation districts and GSAs with a decision support tool that will enable them to easily create and assess recharge scenarios. The tool enables water managers to evaluate *where* (active cropland, fallow land, and dedicated recharge basins), *when* (which weeks across multiple water year types, across a 20 year planning horizon) and *how much* water will be recharged based on best available data and hydrologic, agronomic and geologic science. It enables GSA's to see their most cost effective options and consider the unintended environmental and social impacts in their basins.

GRAT Functionality



- Water available. GRAT allows for multiple user defined future scenarios over 20-year period.
- Fields. Thousands of fields are prioritized based on recharge potential (access to water conveyance, crop type, soils, and geology).
- Recharge. Output provides estimates of acre feet (AF) of water recharged in relation to anticipated pumping.
- Financials. GRAT provides cost estimates of $/AF recharged, based on investment required and timing of cash flows.

Continued end-user engagement

Madera and Tulare Irrigation Districts are beginning to use GRAT's functions to prioritize recharge when excess water is available. Both have stated that GRAT will directly inform several upcoming sizable recharge investments in their districts. The project team is ready to localize GRAT's analytic platform to the unique conditions of other districts/GSAs.

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